

CLAIMS

1. Method for producing a closed metal profile or metal tube, having a wall thickness that varies along a longitudinal axis thereof, comprising:
 - shaping a sheet-metal strip with a strip thickness that varies along a length thereof into a profile or tube using roll-forming tools,
 - sizing the profile or tube in at least one sizing roller pair to predetermined outer dimensions, and
 - welding edges of the sheet-metal strip that are brought together through the shaping and sizing to one another in order to complete the closed profile or tube.
2. Method according to Claim 1, wherein the profile or tube is guided through the at least one sizing roller pair so that a connection plane between a longitudinal center axis of the profile or tube and a center line between the edges of the sheet-metal strip is different from a rotational plane of the sizing roller pair.
3. Method according to Claim 2, wherein the connection plane between the longitudinal center axis of the profile or tube and the center line between the edges of the sheet-metal strip is set approximately at a right angle to the rotational plane of the sizing rollers.
4. Method according to Claim 1, wherein the sheet-metal strip includes sections of different strip thickness that are set relative to each other so that centers of the strip from the different sections lie against each other.
5. Method according to Claim 1, wherein the shaping of the sheet-metal strip into a profile or tube is performed by the roll-forming tools, which form a roller gap interacting in pairs, having an inner width that is varied corresponding to the strip thickness of a section of the sheet-metal strip located at that moment in the gap.

6. Method according to Claim 5, wherein the roller gap is adjusted automatically to the thickness of the section of the sheet-metal strip located at that moment in the gap based on the use of the roll-forming tools, two of which interact, and at least one of the two roll-forming tools is configured to change position using at least one of a motor, a spring mounting, a hydraulic drive, or a pneumatic drive.

7. Method according to Claim 6, wherein the position-changing roll-forming tool is pre-tensioned and/or set pneumatically or hydraulically.

8. Method according to Claim 6, wherein movements of the position-changing roll-forming tool are actively controlled according to a profile of the thickness of the sheet-metal strip.

9. Method according to Claim 8, wherein a computer controls the movements by storing the thickness profile of the sheet-metal strip, wherein progress of the production work is reported to the computer over a path-length measurement device.

10. Method according to Claim 8, wherein the movement of the position-changing roll-forming tool is controlled according to values measured by one or more sensor units for strip thickness measurement.

11. A roll-forming system for performing the method according to Claim 1, the system comprising a plurality of roll-forming tools (3, 5) for shaping a sheet-metal strip (7) into a metal profile or metal tube (18), with a welding station for straight welding of the sheet-metal strip (7) into a closed metal profile or metal tube (18) after it is shaped, and with at least one pair of sizing rollers (16, 17) for sizing the

profile or tube (18) to predetermined outer dimensions, wherein the sizing rollers (16, 17) are arranged between the roll-forming tools (3, 5) and the welding station.

12. Roll-forming system according to Claim 11, wherein the sizing rollers (16, 17) are arranged so that a connection plane between a longitudinal center axis of the profile or tube (18) and a center line between edges (19) of the sheet-metal strip (7) is different from a rotational plane of the sizing rollers (16, 17).

13. Roll-forming system according to Claim 12, wherein the connection plane between the longitudinal center axis of the profile or tube (18) and the center line between the edges (19) of the sheet-metal strip (7) is generally perpendicular to the rotational plane of the sizing rollers (16).

14. Roll-forming system according to Claim 11, wherein at least one part of the roll-forming tools (5, 6) are arranged interacting in pairs so that a roller gap (6) is formed therebetween for simultaneous action on the sheet-metal strip guided through the roll-forming tools (3, 5), at least one of two roll-forming tools (3) interacting in pairs is configured to change position for adjusting the roller gap (6) to a variable thickness of the sheet-metal strip (7) during the shaping process relative to the associated roll-forming tool (5).

15. Roll-forming system according to Claim 14, wherein the position-changing roll-forming tool (3) is configured to change position by spring mounting.

16. Roll-forming system according to Claim 14, wherein the position-changing roll-forming tool (3) is provided with a motor driven, hydraulic, or pneumatic adjustment mechanism (8).

17. Roll-forming system according to Claim 16, wherein the adjustment mechanism (8) is provided with an over-pressure limit (13) for roller pressure.

18. Roll-forming system according to Claim 16, wherein the adjustment mechanism (8) is provided with a controller for adjusting the roller gap (6) as a function of the varying thickness of the sheet-metal strip (7).

19. Roll-forming system according to Claim 18, wherein the controller includes a memory, which stores the thickness profile of the sheet-metal strip (7).

20. Roll-forming system according to Claim 18, wherein the controller of the adjustment mechanism (8) is connected to a sensor unit for strip thickness measurement.